

Weight Maintenance

Energy Balance- Input= Output

Three Factors Affect ENERGY OUTPUT

Basal Metabolic Rate: Energy required to maintain normal body functions while at rest

(60-70% of total energy output)

Factors affecting BMR: (RMR)

Age - slows as we age

Height - taller = more surface area (more heat required)

Growth - more Energy required for kids, teens, pregnant women

Fever - more Energy required to fight infection

Stress - increases all body systems

Fasting/ Starvation - slows BMR

Body Composition - more Energy required to maintain more muscle

Somatotypes Ectomorph Mesomorph Endomorph**Thermogenesis** - Thermic effect of food digestion

(10% of total energy output)

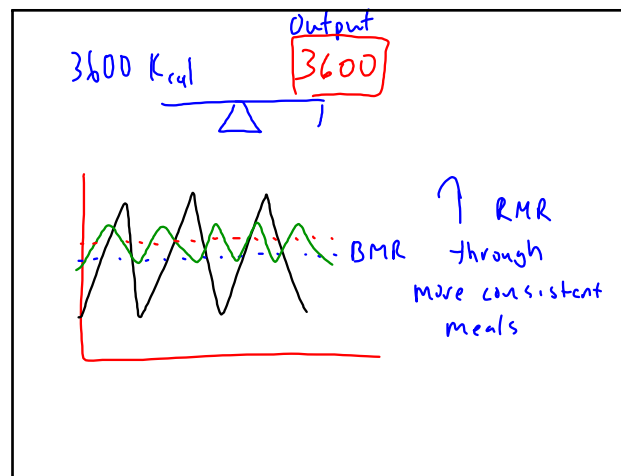
Physical Activity (20-30% of total energy output)

Factors - your body composition (muscle to fat ratio)

- amount of muscle mass required

- amount of time activity takes

Dec 8-11:08 AM



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Everyone is an individual. Some people might feel and perform better at higher or lower body fat percentage than others of the same age and sex. And that's why...

Ranges and guidelines exist. Have a look at the tables below. The first table gives the ideal body fat percentage ranges for the **general population**.

The second table is the average body fat percentage for different **athletes**.

The important thing to remember is...

Anywhere inside the range is good. Staying below the upper limit should be your target but as you'll soon see lower is not necessarily better.

Body Fat Percentage for The Average Population

Age	Up to 30	30-50	50+
Females	14-21%	15-23%	16-25%
Males	9-15%	11-17%	12-19%

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Average Body Fat Percentage of Athletes					
Sport	Male	Female	Sport	Male	Female
Baseball	12-15%	12-18%	Rowing	6-14%	12-18%
Basketball	6-12%	20-27%	Shot Putters	16-20%	20-28%
Body building	5-8%	10-15%	Skiing (X country)	7-12%	16-22%
Cycling	5-15%	15-20%	Sprinters	8-10%	12-20%
Football (Backs)	9-12%	No data	Swimming	9-12%	14-24%
Football (Linemen)	15-19%	No data	Tennis	12-16%	16-24%
Gymnastics	5-12%	10-16%	Triathlon	5-12%	10-15%
High/long Jumpers	7-12%	10-18%	Volleyball	11-14%	16-25%
Ice/field Hockey	8-15%	12-18%	Weightlifters	9-16%	No data
Racquetball	8-13%	15-22%	Wrestlers	5-16%	No data

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Body Mass Index = weight/height²

weight in kg
height in metres

BMI - related to increase of disease

BMI over 27 = overweight

BMI over 30 = Obese

BMI less than 18.5 = underweight

18.5-27- Healthy Bodyweight

Somatotypes

Ectomorph

Mesomorph

Endomorph

Jan 24-8:59 AM

Bio-electrical Impedance

Target body Fat Range

Men 12- 20 %

Women 18-25%


- based on electrical conductivity of fat versus lean body mass

Underwater Weighing

Dec 13-9:45 AM

Waist Measurement Vs. BMI

by Melodie Anne , Demand Media



Using waist measurements and body mass index, or BMI, help your doctor determine your risk of developing obesity-related diseases. Waist measurements include evaluating your waist circumference or comparing your hip measurement to waist circumference, while body mass index is a calculation involving height and weight. Your doctor may use one or both of these methods to evaluate your risk of disease.

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<http://healthyliving.azcentral.com/waist-measurement-vs-bmi-3504.html>

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Waist Circumference

Waist circumference is a quick measurement of your waist to see if you may be overweight. Place a tape measure around your waist directly above your hipbones. Measure your waist after you exhale and empty your lungs. Women with a waist circumference greater than 35 inches and men with a waist circumference greater than 40 inches have a greater risk of obesity-related diseases, such as heart disease and Type 2 diabetes, according to the Institute.

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Waist-to-Hip Ratio

Waist-to-hip ratio is a similar waist measurement that further evaluates your risk of obesity related diseases. Measure your waist in the same manner as you would to get your waist circumference. Then you need to measure the circumference around your hips by keeping the tape measure directly on your hip bones. Next, divide your waist measurement by your hip measurement. For example, if your waist circumference is 35 and your hip circumference is 40, divide 35 by 40. Your waist-to-hip ratio is .88. Women should not have a waist-to-hip ratio greater than .85, while men should not have a ratio greater than 1, explains NHS Choices. If your ratio is too high, you may have too much fat around your midsection, which can affect vital organs.

Body Mass Index

Body mass index does not require any measurements of your waist, you simply need to know your height and current weight. Divide your weight in pounds by height in inches squared and multiply the answer by 703. As an example, if you are 150 pounds and 63 inches tall, divide 150 by 63 times 63. Multiply the result, which is .04, by 703. Your body mass index is 26.6. Ideally your body mass index should fall between 18.5 and 24.9, says the Centers for Disease Control and Prevention. A body mass index below 18.5 means that you may be malnourished, while a body mass index above 24.9 could put you in the overweight category.

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Pros

Whether you use waist measurements or calculate your body mass index, each method is quick and cost effective. Both types of waist measurements, as well as the body mass index, are good starting points to evaluate your level of body fatness. If your waist circumference, waist-to-hip ratio or body mass index numbers are too high, you may need to adjust your diet or start exercising more in order to lose weight.

Cons

These methods do not work for everyone. If you are underweight, waist measurements are not effective. On the other hand, if you are physically fit and have a high percentage of muscle mass, these methods may incorrectly put you in the overweight range. Your waist circumference might be higher than the recommendations if you have a lot of muscle tone. Additionally, muscle weighs more than fat, so using the body mass index often puts athletes in the overweight category.

Which is Best?

Waist-to-hip ratio may be the best indicator for risk of developing obesity-related diseases. A 2003 study conducted by researchers at the Sir Charles Gairdner Hospital in Australia evaluated waist measurements in comparison to body mass index. According to the study, published in "The Medical Journal of Australia," a high waist-to-hip ratio is a better indicator of risk of cardiovascular disease versus waist circumference. Waist-to-hip ratio is also a stronger indicator of heart-related diseases than body mass index, because it specifically accounts for fat around the midsection.

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• Fat cell #
Fat cell size

Jan 9-12:33 PM